IN THE CLAIMS:

This listing of claims will replace all prior versions, and listings, of claims in the application.

1-12. (canceled)

13. (currently amended) A process for production of an aluminum alloy component of an internal combustion engine, which includes at least one area, which during operation of the internal combustion engine is thermally higher loaded than another area, comprising:

- melting that area (4) which is thermally higher loaded during the operation of the internal combustion engine by means of a beam process,
- introducing an additive (8) with a thermal coefficient of expansion lower than said aluminum alloy into the melt pool (6) resulting from the melting, and
- resolidifying said melt pool to develop in the thermal higher loaded area (4) a lower thermal coefficient of expansion (α_2) relative to the thermal lower loaded area (5), such that during operation of the internal combustion engine an even expansion occurs in said thermally higher loaded area relative to said another area.

14. (previously presented) A process according to claim 13, wherein a laser beam is employed for carrying out the beam process.

15. (previously presented) A process according to claim 13, wherein a ceramic material is employed as the additive (8).

16. (previously presented) A process according to claim 13, wherein that the additive is an inter-metallic compound.

17. (previously presented) A process according to claim 13, wherein in the thermal higher loaded area (4) a composition is formed which is modified relative to the thermal less loaded area (5).

18. (previously presented) A process according to claim 13, wherein the component is a cylinder head (1*a*).

19. (previously presented) A process according to claim 18, wherein the thermal higher loaded area (4) is an intermediate area (4*a*) located between respective valve bores (3).

20. (previously presented) A process according to claim 13, wherein the component (1) is a piston.

21. (previously presented) A process according to claim 18, wherein the thermal higher loaded area (4) is a piston bowl or a recess edge.

22. (new) A process according to claim 15, wherein said ceramic material is in the form of powder.

23. (new) A process according to claim 15, wherein said ceramic material is in the form of bristles.

24. (new) A process according to claim 15, wherein said ceramic material is Al_2O_3.

25. (new) A process according to claim 12, wherein that the additive comprises silicon, and wherein said silicon is present in a sufficient amount to reduce the thermal coefficient of expansion to below that of the surrounding area.

26. (new) A process according to claim 16, wherein that the inter-metallic compound is in the form of an intra-metallic dispersion.

27. (new) A process according to claim 16, wherein said intra-metallic dispersion is Al-Fe-Zr/Ce.

28. (new) A process for production of an aluminum alloy component of an internal combustion engine, which includes at least one area, which during operation of the internal combustion engine is thermally higher loaded than another area, comprising:

- melting that area (4) which is thermally higher loaded during the operation of the internal combustion engine by means of a beam process,
- introducing sufficient amount of a ceramic material in the form of bristles or powder as an additive into the melt pool (6) resulting from the melting, and
- resolidifying said melt pool to develop in the thermal higher loaded area (4) a lower thermal coefficient of expansion (α_2) relative to the thermal lower loaded area (5).

29. (new) A process for production of an aluminum alloy component of an internal combustion engine, which includes at least one area which, during operation of the internal combustion engine, is thermally higher loaded than another area, comprising:

- identifying in said aluminum alloy component an area of higher thermal loading bordered by areas of comparatively less thermal loading,
- selecting an additive with a low thermal coefficient of expansion,
- determining a sufficient amount of said additive to be added to said area of higher thermal loading to reduce the thermal coefficient of expansion of said area with higher thermal loading to approximately that of said bordering areas,
- melting that area (4) which is thermally higher loaded during the operation of the internal combustion engine by means of a beam process,
- introducing said sufficient amount of said additive into the melt pool (6) resulting from the melting, and
- resolidifying said melt pool to develop in the thermal higher loaded area (4) a lower thermal coefficient of expansion (α_2) relative to the thermal lower loaded area (5).

30. (new) A process as in claim 29, wherein said additive consists essentially of ceramic material in the form of bristles or powder.